filled holds nearly three grammes (45 grains, 2.8 cubic centimetres) of the solution of potash.

For the milk and the water two ounces are weighed in an ordinary tumbler, then five ounces of water, and the heights at which both quantities of fluid stand are marked on the outside of the glass by attaching pieces of paper.

When the soup is properly prepared it is sweet as milk, and the further addition of sugar is unnecessary; it possesses double the concentration of woman's milk, and can, which is not unimportant for sucklings, be given in the nursing bottle. If it has been heated to the boiling point, it keeps good for twenty-four hours; if this has not been done it turns sour and coagulates like milk; if the addition of potash be neglected, it cannot, in general, be heated to the boiling point without coagulating. In the absence of the potash the soup is difficult of digestion like ordinary milk-pap.

I was first led to prepare this soup by the facts that one of my grandchildren could not be nursed by its mother, and that a second needed a more concentrated food in addition to its mother's milk; the fathers of both children are physicians, who are well able to judge of the effects of the soup. It has proved both in my own family and in other families where it has been introduced, to be an excellent food, and I myself often use it; in coffee it supplies the place of tolerably good cream.

The soup has a slightly mealy or malty taste, to which children soon become so accustomed that they prefer this food to any other. A physician of this place, Dr. Vogel, who has an extensive practice among children, tried to introduce this soup into the families of poor people; in general it did not find acceptance with them, because the thick milk-pap lost its consistence on the addition of the malt, and became thin. The people imagined that its nutritious quality was connected with the thickness of the pap, and was diminished by the malt.—*Medical Press*, May 17, 1865, from *Annalen der Chemie und Pharmacie.*

[We have used this children's food, prepared according to the directions of Prof. Liebig, and have found it to be a most light, easily digestible, and nutritious article of food.]

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

12. *On the Cerebro-Spinal Symptoms and Lesions of Typhus Fever, and on the Relations of Typhus to Epidemic Cerebro-Spinal Symptoms.*—Dr. Charles Murchison, the physician to the London Fever Hospital. whose great experience in various forms of fever, and acknowledged acumen and mature judgment, entitle his opinions to respectful consideration, has presented (*Lancet*, April 22, 1865) the following as the conclusion at which he has arrived in regard to the identity of typhus fever and cerebro-spinal meningitis.

"It is well known," he says, "that among the phenomena of typhus the cerebro-spinal symptoms hold a very prominent place. First, there is headache with vertigo and injected conjunctivæ; then come restlessness, sleeplessness, and delirium, followed by stupor or coma. With these symptoms may be associated paralysis of the sphincters or of the detrusor muscle of the bladder, hyperæsthesia, tremors, floccitatio, subsultus or general convulsions, strabismus, tetanic rigidity of the muscles of the limbs, or even opisthotonos. Occasionally typhus commences with violent delirium and other cerebral symptoms, so that more than once I have known it mistaken for acute mania. The disease, in fact, is the *typhus comatosus* of Sauvages—the *brain fever* of many practitioners. Similar symptoms are sometimes, though more rarely, met with in the course of enteric fever, and have lately been made the subject of a separate monograph by Dr. Fritz.[1]

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[1] Étude Clinique sur divers Symptômes Spinaux observés dans la Fièvre Typhoïde. Paris, 1864.

"Among the most common anatomical lesions of typhus are engorgement of the venous sinuses of the dura mater, increased vascularity of the pia mater, and an accumulation of serous fluid in the ventricles and in the subarachnoid space of the brain and cord.

"It is not many years since these symptoms and lesions were believed to be the result of inflammatory action in the membranes of the brain and cord, and the treatment of typhus was based upon this belief. But the researches of John Reid and of all subsequent observers have demonstrated that there exists no relation whatever between the degree of vascularity and the amount of subarachnoid fluid on the one hand, and the severity of the cerebral symptoms during life on the other; while it is now universally admitted among pathologists that the lesions of typhus are quite independent of inflammatory action. This is the result of my own observations; and the investigations of John Reid. Peacock, Jenner, Jacquot, Barrallier, and of all modern observers who have had much experience in the *post-mortem* examination of typhus, lead to the same conclusion. M. Moering, of the Russian army, examined the cerebral membranes and subarachnoid serosity in upwards of two hundred cases of typhus, but in no instance could he detect a single pus or exudation corpuscle.[1] The brain in typhus becomes atrophied from want of proper nutrition, and the fluid appears to be effused to fill up space. It has been well observed, that those symptoms which indicate inflammation of the brain under ordinary circumstances, do not indicate inflammation when the case is one of typhus fever. Still, it is not surprising that many modern practitioners, having little experience in *post-mortem* examinations, regard the cerebral symptoms and lesions of typhus as due to inflammation, and that when the disease shows itself in countries where it is little known this should be the common opinion.

"But to the rule above laid down there are exceptions. In rare cases, typhus fever is complicated with unmistakable inflammation of the membranes of the brain. At the time of publication of my work on fevers I was under the impression that this complication never occurred, but subsequent experience has convinced me that I was mistaken. In the interval I have met with two unequivocal cases of typhus complicated with true meningitis and the effusion of lymph on the surface of the brain. One case was that of an infant aged seven months, admitted with his mother into the London Fever Hospital. Both mother and child had a characteristic typhus rash. The infant was feverish and very restless, moved his head constantly from side to side, and died about the fifth or sixth day of his illness, death being preceded by a severe attack of convulsions. After death the pia mater was found to be intensely injected, and there was a quantity of solid lymph plastered over the base of the brain. The second case was that of a girl aged nineteen, who had previously enjoyed good health. During the first night of her illness she was delirious; in the second night she had acute delirium, followed next day by coma. On the fourth day of her illness an eruption of typhus appeared on the chest and abdomen, and rapidly became petechial. On the following morning, at three A. M., the patient died comatose. On examining the body, the petechiæ on the skin were found to be persistent. There was intense injection of the pia mater and of the brain-substance. The white matter presented a pinkish tint, and the gray matter a dark chocolate hue. Large patches of soft, opaque, yellow lymph were found on the surface of the hemispheres following the course of the veins. There was no lymph at the base, and no subarachnoid serosity. Each of the lateral ventricles contained about half a drachm of turbid fluid. In a third case, a girl aged five, admitted into the London Fever Hospital, typhus proved fatal about the fifteenth day from tubercular meningitis; but in the two first-mentioned cases no trace of tubercle could be discovered either in the membranes of the brain or in the lungs. In an epidemic of typhus in 1831, several cases were observed by Dr. Roupell, in the Seamen's Hospital, in which lymph or pus was found deposited beneath the arachnoid.[2] Some of these cases were dissected by Mr. George Busk, F. R. S., who, I find, corroborates Dr. Roupell's description. A case of typhus complicated with true meningitis is reported by Jacquot.[1] Louis also records two cases of enteric fever in which the signs of recent meningitis were found after death.[2]

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[1] Jacquot, Du Typhus de l'Armée d'Orient, 1858, p. 244.

[2] Roupell on Typhus Fever, 1839, pp. 108, 217.

"The above remarks appear to me to be not altogether irrelevant to the subject of what is called 'epidemic cerebro-spinal meningitis,' about which much has been said in connection with the epidemic now prevailing in Russia and Germany. The accounts of this epidemic make it clear that it consists for the most part of relapsing fever and typhus, and that in this respect it resembles the Irish epidemic of 1847. One of the diseases composing it, however, has been described as cerebro-spinal meningitis—a true inflammation of the pia mater accompanied by the effusion of lymph or pus, attacking chiefly young children, and 'decidedly infectious.' This malady has been spoken of as prevailing at St. Petersburg, but more especially at Dantzic, on the Polish frontier of Prussia, and in Brunswick, Hesse, and Hanover.

"Epidemic cerebro-spinal meningitis is said to have been first accurately observed at Geneva in 1805, and since then epidemics of it are recorded as occurring in France, Italy, Norway, Denmark, Ireland, and America. For a full account of all these epidemics I must refer to the elaborate works of Boudin[3] and Hirsch.[4]

"It is possible that some of these epidemics were really examples of primary inflammation of the cerebral and spinal membranes; but when this seemed to be the case, it is to be noted that the persons attacked were comparatively few, that no eruption appeared on the skin, and that there was no evidence of the disease being infectious. I would instance in particular the epidemic described by Dr. Mayne, as attacking children in several of the Irish workhouses in 1846, with regard to which the absence was noted 'of any proof that it has ever been propagated by contagion.'[5] But most of the epidemics, it is to be observed, occurred under precisely the same circumstances as those in which typhus appears—that is to say, they occurred in overcrowded and badly ventilated barracks, prisons, and workhouses, and among the poorest of the civil population living in overcrowded houses and narrow courts.[6] Speaking of the French epidemics, M. Corbin[7] says: 'La cause principale à nos yeux (et en cela nous sommes d'accord avec M. Tourdes, avec M. Gasté, et avec la plupart des médecins militaires), c'est l'encombrement.' Speaking of the epidemic in Italy, M. Devilliers writes: 'Elle atteignait des populations pauvres, entassées quelquefois pendant l'hiver pêle-mêle avec les bestiaux.' Like typhus, the disease has been most prevalent in winter and spring, and, like typhus, it has been propagated by contagion. It is true that some writers have doubted its contagious character, just as some observers have denied that typhus is contagious; but the fact that the disease has in many instances been transported by certain French regiments from one locality to another,[8] in my opinion settles the question.[9]

"The American epidemics of cerebro-spinal meningitis, which have been regarded as the precise counterpart of those observed in Europe, may be selected for more detailed investigation; and, in the first place, it is a significant fact that in America 'epidemic cerebro-spinal meningitis' has long been known by the designation 'spotted fever.' At the present time both terms are applied indiscriminately to the same disease. Among its chief symptoms are: rigors, headache, and vomiting, succeeded by acute delirium, and afterwards by coma, and in some cases by convulsions or tetanic rigidity of the muscles; a dry brown tongue; injected conjunctivæ; albuminous urine, and an eruption upon the skin rapidly becoming petechial. The principal *post-mortem* appearances are: increased vascularity of the meninges of the brain and cord; an effusion of serum beneath the arachnoid and into the ventricles; occasionally lymph or pus beneath the arachnoid; hypostatic congestion of the lungs; enlargement of the spleen; a fluid condition of the blood, and extravasations of blood in various parts of the body. Two of these characters require especial notice—viz., the eruption, and the lesions of the cerebro-spinal membranes. One writer describes the eruption as sometimes 'like measles;'[1] a second, as 'not unlike the spots seen in enteric and typhus fever,' and as sometimes presenting 'all grades from the rose-coloured rash to the deep and permanent petechiæ;'[2] while a third writes of them thus: 'The more recent and smaller ones disappeared on pressure, while the larger ones were ecchymotic in character. The larger ones were dark in their centres, and of a light red along their margins. Their form was exceedingly irregular; they were notched and irregular in outline, and either angular or nearly rounded, none having any definite oval form.'[3] Lastly, Dr. Upham, in one of the ablest memoirs on the subject, observes: 'Petechiæ were not an unfrequent manifestation—in appearance almost identical with the true typhus eruption, and, like that, seen upon every part of the body except the face—persistent on pressure, varying in hue from the darkest aspect of measles to that of the true petechial spots imbedded in the skin.'[4] No better description could be given of the eruption of typhus. With regard to the cerebral lesions, it is to be noted that though, as in typhus, lymph and pus were found in some cases, in many the effusion was simple serum, while in others the brain and membranes were perfectly healthy; so that, according to a late writer, 'the conclusion is irresistible that the disease consists of a pathological condition of the system at large, whereof the various local lesions are but the accidental complications.'[5] If to the above characters be added the facts that its contagiousness is a disputed question, and that it has been found to prevail chiefly under circumstances of overcrowding and inadequate ventilation,[6] it cannot be surprising that many American physicians admit the close relation of cerebro-spinal meningitis to typhus, while some maintain the identity of the two diseases.[7] It may be well, therefore, to consider the four points of distinction between them laid down by one of the latest writers on the subject, Dr. Lidell,[8] and in doing so I adopt the writer's own words.

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[1] Jacquot, op. cit., p. 228. [2] Louis, La Fièvre Typhoïde (Obs. 17 and 25).

[3] Boudin, Traité de Géographie Médicale.

[4] Hirsch, Handbuch der Historisch-geograph. Pathologie. Zweiter Bd., s. 624.

[5] Dub. Quar. Journ. of Med. Sci., July, 1846, p. 95.

[6] Hirsch, op. cit., p. 651. [7] Gaz. Méd. de Paris, 1848, p. 444.

[8] Hirsch, op. cit., p. 650.

[9] "Serait il permis à votre rapporteur d'émettre ici, sous sa responsabilité, l'opinion que la maladie appelée méningite cérébro-spinale, ne serait que la forme nerveuse, ataxique, tétanique du typhus lui même."—Gaultier de Claubry, Rapport sur les Epidémies qui ont régné en France de 1841 à 1846. Mém. de l'Acad. de Méd., xiv. 158.

"1. 'Spotted fever often runs its course in a few hours; typhus requires at least several days.' .The rapid course of many of the American cases, and of epidemic cerebro-spinal meningitis generally, is no doubt remarkable, but is not sufficient to found a distinction, for many cases of typhus are on record where the disease has terminated fatally on the second or third day, or even after a few hours. Such were the cases of *typhus siderans*, or *blasting typhus*, which devastated the garrisons of Saragossa, Torgau, Wilna, and Mayence during the wars of the first Napoleon. Similar cases were observed in Ireland during the epidemic of 1847–48, and amongst the French troops in the Crimea in 1856.[9]

"2. 'Spotted fever is frequently attended with convulsive movements; typhus is never so accompanied.' My experience of typhus is precisely the reverse. Convulsive movements are not uncommon. During the last three years upwards of forty cases of typhus complicated with general convulsions have been observed at the London Fever Hospital,[10] and in several instances I have noted strabismus, tetanic contractions of the muscles of the limbs, and even opisthotonos.

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[1] Report on Spotted Fever in New England, p. 131. 1810.

[2] Woodward, American Medical Times, May 14, 1864, p. 232.

[3] Clark, ib., p. 236.

[4] Hospital Notes and Memoranda on Epidemic Cerebro-Spinal Meningitis. Boston, 1863.

[5] American Journal of the Medical Sciences, Jan. 1865, p. 27. See also ib., July, 1864, pp. 138–140.

[6] *Vide* Upham, op. cit., p. 28.

[7] American Medical Times, May, 1864, p. 237; and Upham, op. cit., p. 37.

[8] American Journal of the Medical Sciences, Jan. 1865, p. 26.

[9] For references to these epidemics, see my work on Fevers, p. 179.

[10] Ib., p. 160.

"3. 'Spotted fever patients often die very suddenly and unexpectedly of coma and asphyxia; typhus patients do not die in this way.' According to my experience of typhus, the most common mode of death from the primary fever is by a combination in various proportions of syncope and coma. A large proportion, also, of fatal typhus cases are complicated with pulmonary disease, and then death occurs by coma and asphyxia. Moreover, I have repeatedly known patients who appeared to be going on well become suddenly comatose, and die in a few hours.

"4. 'The eruption in spotted fever frequently appears on the first day; while in typhus the eruption does not appear till the end of a week or more.' According to my experience, the eruption of typhus usually appears on the third or fourth day, is rarely delayed beyond the sixth day, and may sometimes be noted on the second day. It is well known, also, that in severe cases of most blood diseases petechiæ may appear as early as the first day. The sooner the eruption of variola appears the more grave is the case.

"These considerations seem to justify the opinion that the grounds for drawing a specific distinction between the epidemic cerebro-spinal meningitis or spotted fever of America and typhus fever are most inconclusive, and particularly when it is recollected that typhus fever running the ordinary course has been prevailing in many parts of America since the commencement of the present war. I agree entirely with the opinion expressed by Dr. Upham. 'The disease,' he says, 'seemed to me rather to partake of the nature of typhus, in a severe and malignant form, identical in its essential elements with the typhus fever of Great Britain, which, under the names of maculated typhus, ship fever, camp or jail fever, has many times been observed in this country—having, in this instance, a special direction to the meninges of the brain and spinal cord.' And if we study the account of the epidemic cerebro-spinal meningitis which is said to prevail at present in Russia and Germany by the light of the American descriptions, we are forced, I think, to a similar conclusion. It is needless to recapitulate the symptoms of this epidemic, for they are almost identical with those observed in America, including an eruption which sometimes resembles that of measles. But if we bear in mind, further, that this Russian cerebro-spinal meningitis is said to be 'decidedly infectious,' that its prevalence is favoured by overcrowding and bad ventilation, and that there is a concurrent epidemic of undoubted typhus, it seems probable that the infectious cerebro-spinal meningitis of Russia and Germany is merely typhus running a rapid course, with severe cerebral symptoms, and sometimes with actual meningitis, as in the cases observed at the London Fever Hospital. At all events, the possibility of such being the case must not be lost sight of.

"It would be a fit subject for inquiry if any relation exists between the frequency of convulsions in the typhus of Russia and the use of bread containing spurred rye. A disease, termed 'convulsive ergotism,' distinguished by the characters of an acute comatose affection—giddiness, dimness of vision, insensibility, convulsions, imperceptible pulse, and death within two days—is said to prevail in the epidemic form in various parts of the continent where rye constitutes a considerable proportion of the food of man.[1] There is, however, no evidence or probability that this disease is infectious.

"In conclusion, I would only observe that, before attempting to establish a new specific disease, it is necessary to keep in view the many modifications which those already known to us may undergo; and more particularly to study their etiological relations, and the circumstances under which they arise and are propagated."

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13. *Different Spinal Symptoms observed in Typhoid Fever.*—The occurrence during late years of an epidemic disease, termed by some cerebro-spinal meningitis, by others spotted fever, and in many instances its prevalence simultaneously with typhoid and typhus fever has led to a discussion in regard to the relation-

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[1] *Vide* Christison, Treatise on Poisons, p. 668. 1829.